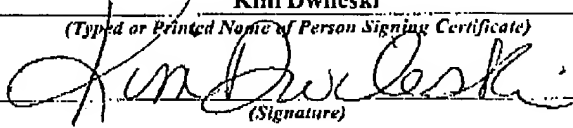


CERTIFICATE OF TRANSMISSION BY FACSIMILE (37 CFR 1.8)			Docket No. END920000187US1	
Applicant(s): Hall et al.				
Application No. 09/884,778	Filing Date 6/19/2001	Examiner Dinh, T.	Group Art Unit 2841	
Invention: METHOD AND APPARATUS TO ESTABLISH CIRCUIT LAYERS INTERCONNECTIONS				
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TRANSMITTAL OF APPEAL BRIEF (Large Entity)					Docket No. END920000187US1	
In Re Application Of: Hall et al.						
Application No. 09/884,778	Filing Date 6/19/2001	Examiner Dinh, T.	Customer No. 30449	Group Art Unit 2841	Confirmation No.	
Invention: METHOD AND APPARATUS TO ESTABLISH CIRCUIT LAYERS INTERCONNECTIONS						
<u>COMMISSIONER FOR PATENTS:</u>						
Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on 1/5/2005						
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<input type="checkbox"/> A check in the amount of the fee is enclosed.						
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<input checked="" type="checkbox"/> The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 09-0457(IBM)						
<input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.						
WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.						
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Jack P. Friedman Reg. No. 44,688 Schmeiser, Olsen & Watts 3 Lear Jet Lane, Suite 201 Latham, NY 12110 (518) 220-1850			<div style="border: 1px solid black; padding: 5px;"><p>I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on</p><p>_____ (Date)</p><p>_____ Signature of Person Mailing Correspondence</p><p>_____ Typed or Printed Name of Person Mailing Correspondence</p></div>			
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Docket No.: END920000187US1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Hall et al.

Examiner: Dinh, T.

Serial No.: 09/884,778

Art Unit: 2841

Filing Date: 6/19/01

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MAR 03 2005Title: METHOD AND APPARATUS TO ESTABLISH CIRCUIT LAYERS
INTERCONNECTIONSCommissioner for Patents
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Alexandria, VA 22313-1450

BRIEF OF APPELLANTS

This Appeal Brief, pursuant to the Notice of Appeal filed January 5, 2005, is an appeal from the rejection by the Examiner in the Office Action dated October 6, 2004.

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International Business N

RELATE

None.

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Please file
appeal brief.

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STATEMENT OF CLAIMS

Claims 1-20, 25, and 26 are withdrawn. Claims 33-34 are canceled. Claims 21, 22, 24, 27, 28, 31 and 36-39 are rejected. Claims 23, 29, 30, 32, and 35 are allowed. The rejection of

09/884,778

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claims 21, 22, 24, 27, 28, 31 and 36-39 are being appealed. This Brief is in support of an appeal from the rejection of claims 21, 22, 24, 27, 28, 31, and 36-39.

STATUS OF AMENDMENTS

There are no Amendments which have not been entered. The after-final amendment of claims 23, 29, and 30 was entered for purposes of appeal.

SUMMARY OF CLAIMED SUBJECT MATTER

The present invention discloses a method of forming a conductive path within a laminate 10C, comprising: providing an opening 12C in the laminate; pressing a conductive element 14C into the opening such that a portion of at least one end of the conductive element extends beyond a surface 18C of the laminate; and applying a compressive pressure to the portion of the at least one end of the conductive element, wherein the compressive pressure applied to the portion of the at least one end 24 of the conductive element forms a contact pad 20D extending beyond the surface of the laminate, and wherein the conductive element may include an inner element covered by an outer element. The opening may be a hole. The conductive element may be a cylinder. See FIGS. 5-6 and specification, page 6, line 18 - page 7, line 5.

The present invention discloses a structure for interconnection between circuit layers, comprising: a laminate 10 having a conductive inner plane 15C; a conductive pad 20 on a surface 18 of the laminate, wherein a bottom surface of the conductive pad is in direct mechanical contact with the surface of the laminate; a conductive element 14A having a lower portion and an

upper portion, wherein the lower portion of the conductive element is embedded into the laminate, wherein the upper portion of the conductive element extends above the surface of the laminate, wherein the conductive pad circumscribes the upper portion of the conductive element, wherein the conductive element electrically connects the conductive inner plane to the surface of the laminate, wherein the lower portion of the conductive element comprises a conductive material, and wherein the upper portion of the conductive element comprises the conductive material. The structure may include an opening 12 in the laminate that the conductive element is pressed into. See FIG. 3 and specification, page 6, lines 3-9. The conductive material may be selected from the group consisting of: gold, copper, brass, and bronze. See specification, page 5, lines 9-11.

The present invention discloses a structure for interconnection between circuit layers, comprising: a first laminate 10I having a first conductive element 14I embedded into the first laminate wherein a portion of the first conductive element forms at least one contact pad 20I¹ extending beyond a surface of the first laminate; a second laminate 10J having a second conductive element 14J embedded into the second laminate wherein a portion of the second conductive element forms at least one contact pad 20I extending beyond a surface of the second laminate; and a bonding layer 36 between the first and second laminates such that the contact pads of the first and second conductive elements are electrically connected, wherein the bonding layer comprises conductive metal filled epoxy. See FIGS. 12-13 and specification, page 8, line 20 - page 9, line 19.

The present invention discloses a method of forming a conductive path within a laminate 10H, comprising the steps of: providing a conductive element 10G; projecting the conductive

element toward a surface 18H of the laminate impacting the surface of the laminate by the conductive element, wherein said impacting forms a hole in the laminate such that the entire conductive element provided in the providing step becomes embedded within the hole. The conductive element may be a sphere. See FIGS. 10-11 and specification, page 8, lines 13-19.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL.

1. Claims 27, 28, and 31 stand rejected under 35 U.S.C. §102(b) as being unpatentable over Reimann (U.S. Patent 4,663,497).
2. Claims 21-22, 24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Lloyd ('523) in view of Watanabe et al. (U.S. Patent 5,319,159).
3. Claim 36 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Lloyd (U.S. Patent 3,601,523) in view of Reimann ('497).
4. Claim 37 standss rejected under 35 U.S.C. §103(a) as being unpatentable over Curcio et al. (U.S. Patent 6,504,111) in view of Condensed Chemical Dictionary of Hawley's (hereafter CCD).
5. Claims 38-39 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Rosenthal et al. (US Patent 3,105,729) in view of Reimann ('497).

ARGUMENT**GROUND OF REJECTION 1**

Claims 27, 28, and 31 stand rejected under 35 U.S.C. §102(b) as being unpatentable over Reimann (U.S. Patent 4,663,497).

Claims 27, 28, and 31

Appellants respectfully contend that Reimann does not anticipate claim 27, because Reimann does not teach each and every feature of claim 27. For example, Reimann does not teach “wherein the lower portion of the conductive element comprises a **conductive material**, and wherein the upper portion of the conductive element comprises the **conductive material**” (emphasis added).

The language in the preceding feature of claim 27 requires the lower portion and upper portion of the conductive element to comprise the same conductive material. However, the Examiner alleges that in Reimann, the conductive material 38 represents the lower portion of the conductive element of claim 27, and the conductive resist 40 represents the upper portion of the conductive element of claim 27. Reimann states in very strong language that the conductive material 38 and the conductive resist 40 cannot comprise the same conductive material. See Reimann, col. 2, lines 47-50, which recites: “While the conductive cladding and conductive via material may be of the same substance, the resist material must be of a composition which is different therefrom.” Accordingly, Appellants maintain that Reimann does not anticipate claim 27.

In “Response to Arguments”, the Examiner asserts: “Examiner discloses in the previous

Office action of portion #2, page 2 that the lower and upper portion of the conductive element, each made by conductive material, see column 4, lines 7-11, the lower portion (38) made by a copper, which is a conductive material, and the upper portion (40) made by metallic/conductive resist, which is the conductive material. Even though, copper is different from metallic/conductive resin, but they are conductive material. Further, Appellant does not specifically claimed the specific type of the conductive material in claim 27. Therefore, it is believes the Reimann reference disclosed these limitations as discuss as above.”

In response to the preceding assertion by the Examiner in “Response to Arguments”, Appellants point directly to the claim language in claim 27. The first feature in claim 27 of “wherein the lower portion of the conductive element comprises a conductive material” establishes an antecedent basis for “a conductive material”. The second feature in claim 27 of “wherein the upper portion of the conductive element comprises the conductive material” refers to “the conductive material” which has antecedent basis in “a conductive material” recited in the first feature in claim 27. Therefore, by well-established rules of claim construction, “the conductive material” of the second feature in claim 27 is unconditionally required to be the same conductive material as “a conductive material” in the first feature of claim 27.

Based on the preceding arguments, Appellants respectfully maintain that Reimann does not anticipate claim 27, and that claim 27 is in condition for allowance. Since claims 28 and 31 depend from claim 27, Appellants contend that 28 and 31 are likewise in condition for allowance.

GROUND OF REJECTION 2

Claims 21-22, 24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Lloyd ('523) in view of Watanabe et al. (U.S. Patent 5,319,159).

Claims 21-2 and 24

Appellants respectfully contend that claim 21 is not unpatentable over Lloyd in view of Watanabe, because Lloyd in view of Watanabe does not teach or suggest each and every feature of claim 21. For example, Lloyd in view of Watanabe does not teach or suggest the features: "pressing a conductive element into the opening such that a portion of at least one end of the conductive element extends beyond a surface of the laminate" and "applying a compressive pressure to the portion of the at least one end of the conductive element, wherein the compressive pressure applied to the portion of the at least one end of the conductive element forms a contact pad extending beyond the surface of the laminate".

The Examiner argues that "Lloyd discloses ... pressing a conductive element (15 and 16, column 3, lines 9, and 30-32), see figure 4, into the opening (14) such that a portion of at least one end of the conductive element extends beyond a surface of the laminate; applying a compressive pressure to the at least one end of the conductive element (15, 16), see column 3, lines 20-24 whereby the compressive pressure applied to the at least one end of the conductive element (15, 16) forms a contact pad (35, 37, column 3, lines 37-38) extending beyond a surface of the laminate (10), see figure 6" (emphasis added).

As a first argument by Appellants, Appellants respectfully contend that the preceding

argument by the Examiner is logically inconsistent, because in Lloyd the only conductive element that is pressed into the opening 14 is the conductive element 15 as shown in FIGS. 1-3 of Lloyd. After the opening 14 is completely filled with the conductive element 15, the conductive element 16 is added as a conductive powder on top of the conductive element 15 as shown in Lloyd, FIGS. 3-4 and describe in Lloyd, col. 3, lines 30-33. Thus, the combination of conductive elements 15 and 16 cannot represent the conductive element of claim 36 that is pressed into the opening 14. Accordingly, the Examiner's description of the conductive element (15, 16) as being pressed into the opening 14 is logically inconsistent with the Examiner's description of the conductive element (15, 16) as subjected to the compressive pressure that allegedly forms the contact pads 35 and 37. Therefore, Appellants respectfully contend that the preceding argument by the Examiner has not established a *prima facie* case of obviousness in relation to claim 36.

As a second argument by Appellants, Appellants interpret the preceding argument by the Examiner to assert that reference numeral 10 in FIGS. 1-6 of Lloyd represents the laminate of claim 21, so that the portion of the conductive element 15 in Lloyd, FIG. 3 that exists within the upper and lower boundaries of the conductor 11 extends beyond a surface of the alleged laminate 10 as required by claim 21.

In response, Applicants disagree with the Examiner's interpretation of the numeral 10 in FIGS. 1-6 of Lloyd as representing the laminate of claim 21, because Lloyd discloses on col. 2, line 65 that the reference numeral 10 represents a single insulting layer and not a laminate. A laminate is "a laminated product, a plywood". The American Heritage Dictionary 712 (2d ed. 1985), Houghton Mifflin Company, Boston. To laminate is "[t]o make by uniting into several

layers". *Id.* Thus, a laminate must comprise at least two layers laminated together, which is not satisfied by the insulating layer 10 of Lloyd since the insulating layer 10 is only a single layer. Therefore, Applicants respectfully maintain that the insulating layer 10 of Lloyd is not a laminate and the Examiner's argument is accordingly not persuasive in relation to claim 21.

Applicants additionally cite the Examiner as admitting on page 5, line 15 of the office action that the insulating layer 10 is not a laminate. In particular, the Examiner specifically states on page 5, line 15 of the office action that "Lloyd discloses the claimed invention, except for the insulator being a laminate".

As a third argument by Appellants in accordance with the preceding admission by the Examiner that Lloyd does not disclose the laminate of claim 36, the Examiner argues: "It is very well known to use laminated as an insulation to allow the insertion of internal layers such as conductive or insulating layers in order to control the coefficient of thermal expansion (CTE) and dielectric properties.... Reimann shows a laminate (22, 24) disclosed in figure 8.... It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a laminate as taught by Reimann to modify the insulator of Lloyd in order to provide a CTE and dielectric properties for a lamination layer."

In response, Appellants respectfully contend that the Examiner's preceding argument for modifying Lloyd by using the laminate disclosed by Reimann in place of the insulator 10 of Lloyd is not persuasive.

A first reason why the modification of Lloyd by Reimann is not persuasive is that the Examiner has not cited prior art evidence to show that it was known in the prior art to provide a

laminate "to provide a CTE and dielectric properties for a lamination layer".

A second reason why the modification of Lloyd by Riemann is not persuasive is that since Lloyd's insulator 10 has a CTE and dielectric properties, it is not obvious to use a laminate instead of the insulator 10 "to provide a CTE and dielectric properties".

A third reason why the modification of Lloyd by Riemann is not persuasive is that substitution of Riemann's laminate (22, 24) for Lloyd's insulator 10 is irrelevant to Lloyd for the following reason. The purpose of Lloyd's invention as disclosed in Lloyd, col. 2, lines 16-19: "The present invention overcomes the problem of unreliable or low quality electrical connections between the through hole conductive plastic material and the printed circuits located on opposite sides of an insulating layer." Thus Lloyd's invention is specific to an insulating layer and not to a laminate. Also, Lloyd solves the problem of unreliable connections by teaching "a very reliable low resistance through hole connector to which terminals can be readily fastened with complete assurance of a solid electrical contact between both sides of the board" (see Lloyd, col. 2, lines 42-45). Therefore the addition of Riemann's conductor 24 to the dielectric 22 to form the laminate does not contribute to solving the problem of unreliable connections between printed circuits located on opposite sides of the board.

Based on the preceding arguments, Appellants respectfully maintain that claim 21 is not unpatentable Lloyd in view of Watanabe, and that claim 21 is in condition for allowance. Since claims 22 and 24 depend from claim 21, Appellants contend that claims 22 and 24 are likewise in condition for allowance.

GROUND OF REJECTION 3

Claim 36 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Lloyd (U.S. Patent 3,601,523) in view of Reimann ('497).

Claim 36

Appellants note that the Examiner asserts that "Claims 36 is rejected under 35 U.S.C. 103(a) as being anticipated by Lloyd (U. S. Patent 3,601,523) in view of Reimann ('497)". In response, Appellants maintain that the rejection of claim 36 is improper because a claim cannot be anticipated under 35 U.S.C. §103(a) and also because a claim cannot be anticipated by a combination of references.

In addition, Appellants respectfully contend that the Examiner's argument for combining Lloyd and Reimann is not persuasive. The Examiner argues without providing any supporting evidence from the prior art: "It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a laminate as taught by Reimann to modify the insulator of Lloyd in order to provide internal connections of internal circuits formed inside and reduce strength."

Instead of supplying a prior art reference to support the preceding argument, the Examiner alleges: "It is very well known to use laminated as an insulation to allow the insertion of internal layers such as conductive or insulating layers in order to provide internal connections of internal circuits formed inside and reduce strength."

In response, Appellants previously challenged the Examiner's allegation that "[i]t is very

well known to use laminated as an insulation to allow the insertion of internal layers such as conductive or insulating layers in order to provide internal connections of internal circuits formed inside and reduce strength". Moreover, Appellants previously requested that the Examiner provide adequate evidentiary support as required by MPEP 2144.03C. Appellants note the Examiner has not supplied said requested evidentiary support.

Furthermore, Appellants further contend that the phrase "reduce strength" is ambiguous and requires clarification.

Furthermore, Appellants contend that Lloyd does not teach or suggest a need to provide internal connections of internal circuits formed inside and reduce strength.

Moreover, the Examiner has not supplied a legally persuasive argument as to why a person of ordinary skill in the art would modify Lloyd by the alleged teaching of Reimann in relation to claim 36. In particular, established case law requires that the prior art must contain some suggestion or incentive that would have motivated a person of ordinary skill in the art to modify a reference or to combine references. See *Karsten Mfg. Corp. V. Cleveland Gulf Co.*, 242 F.3d 1376, 58 U.S.P.Q.2d 1286, 1293 (Fed. Cir. 2001 ("In holding an invention obvious in view of a combination of references, there must be some suggestion, motivation, or teaching in the prior art that would have led a person of ordinary skill in the art to select the references and combine them in a way that would produce the claimed invention"). See also *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984 ("The mere fact that the prior art could be so modified would not have made the motivation obvious **unless the prior art suggested the desirability of the modification.**")). The Examiner has not made any showing of where the prior art suggests employing a laminate "in order to provide internal connections of internal circuits

formed inside and reduce strength". Thus, the Examiner has provided a reason for the combination by speculation, and not by teachings of the prior art. By not citing any suggestion or incentive in the prior art employing a laminate "in order to provide internal connections of internal circuits formed inside and reduce strength", the Examiner has failed to establish a *prima facie* case of obviousness in relation to claims 36.

Based on the preceding arguments, Appellants respectfully maintain that claim 36 is not unpatentable over Lloyd in view of Reimann, and that claim 36 is in condition for allowance.

GROUND OF REJECTION 4

Claim 37 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Curcio et al. (U.S. Patent 6,504,111) in view of Condensed Chemical Dictionary of Hawley's (hereafter CCD).

Claim 37

Appellants note that the Examiner asserts that "Claim 37 is rejected under 35 U.S.C. 103(a) as being anticipated by Curcio et al. (U. S. Patent 6,504,111) in view of Condensed Chemical Dictionary of Hawley's (hereafter CCD)". In response, Appellants maintain that the rejection of claim 37 is improper because a claim cannot be anticipated under 35 U.S.C. §103(a) and also because a claim cannot be anticipated by a combination of references.

Additionally, Appellant contends that Curcio cannot be used as prior art in rejecting claims of the present patent application, because "[e]ffective November 29, 1999, subject matter which was prior art under former 35 U.S.C. 103 via 35 U.S.C. 102(c) is now disqualified as prior art against the claimed invention if that subject matter and the claimed invention 'were, at the time the invention was made, owned by the same person or subject to assignment by the same person.'" MPEP 706.02(1)(1). First, the present patent was filed on June 19, 2001 which is after November 29, 1999. Second, the Curcio patent is being considered by the Examiner as prior art under former 35 U.S.C. 103 via 35 U.S.C. 102(c), because the Curcio patent issued on January 7, 2003 which is after the filing date of June 19, 2001 of the present patent application. Third, both the subject matter of Curcio patent and the claimed invention of the present patent application were, at the time the invention was made, owned by International Business Machines Corporation or

subject to assignment by International Business Machines Corporation. Accordingly, Appellant respectfully maintains that Curcio cannot be used as a prior art reference.

In addition, Appellants respectfully contend that claim 37 is not unpatentable over Curcio in view of CCD, because Curcio in view of CCD does not teach or suggest each and every feature of claim 37. For example, Curcio in view of CCD does not teach or suggest "a bonding layer between the first and second laminates such that the contact pads of the first and second conductive elements are electrically connected, wherein the bonding layer comprises conductive metal filled epoxy".

The Examiner admits: "Curcio discloses the claimed invention, except for specifying that the thermosetting resin/polymer is epoxy."

The Examiner argues: "Epoxy is one of the best-known thermo sets in the electronic industry used in circuit boards. CCD shows epoxy resin as adhesives for composites and for metals glass, and ceramics disclosed in page 450, column 1.... It would have been obvious to one having ordinary skill in the art at the time the invention was made to have epoxy to provide the thermosetting resin/polymer of Curcio, as taught by CCD, because the epoxy is well known thermosetting material for use in the circuit boards for the purpose of providing a high coefficient of thermal expansion, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416."

In response, Appellants contend that the preceding argument by the Examiner is not persuasive for at least the following reasons.

09/884,778

15

A first reason that the preceding argument by the Examiner is not persuasive is that the Examiner has made an unsupported allegation of what is "best-known" which Appellants have disputed and requested that the Examiner provide adequate evidentiary support as required by MPEP 2144.03C. Appellants note the Examiner has not supplied said requested evidentiary support. Appellants contend that the Examiner's reference to CCD showing that epoxy resin are known as adhesives for composites and for metals glass, and ceramics does not establish that epoxy is "one of the best-known thermo sets in the electronic industry used in circuit boards".

A second reason that the preceding argument by the Examiner is not persuasive is that the Examiner has not alleged or supported the use of an conductive metal filled epoxy for use as a bonding layer for electrically connecting **contact pads** as is required in claim 37.

A third reason that the preceding argument by the Examiner is not persuasive is that the Examiner has not provided any evidence from the prior art to support the alleged motivation to have an conductive metal filled epoxy for use as a bonding layer for electrically connecting contact pads for the reason of having a high coefficient of thermal expansion. First, the phrase "high coefficient of thermal expansion" is ambiguous since the Examiner has not specified the scope of "high". Second, the Examiner has not shown motivation found in the prior art for having a high coefficient of thermal expansion in a bonding layer for electrically connecting contact pads. Third, the Examiner argues the use of epoxy as an obvious design choice for the purpose of providing a high coefficient of thermal expansion, whereas there is no teaching or suggestion in Curcio that having a high coefficient of thermal expansion is a purpose of having a conductive adhesive between contact pads.

Based on the preceding arguments, Appellants respectfully maintain that claim 37 is not unpatentable over Curcio in view of CCD, and that claim 37 is in condition for allowance.

GROUND OF REJECTION 5

Claims 38-39 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Rosenthal et al. (US Patent 3,105,729) in view of Reimann ('497).

Claims 38-39

As an initial point, Appellants maintain that the rejection of claims 38-39 is improper because a claim cannot be anticipated under 35 U.S.C. §103(a) and also because a claim cannot be anticipated by a combination of references.

Appellants note that the Examiner asserts that "Claims 38-39 are rejected under 35 U.S.C. 103(a) as being anticipated by Rosenthal et al. (US Patent 3,105,729) in view of Reimann ('497)". In response, Appellants maintain that the rejection of claims 38-39 is improper because a claim cannot be anticipated under 35 U.S.C. §103(a) and also because a claim cannot be anticipated by a combination of references.

In addition, Appellants respectfully contend that claim 38 is not unpatentable over Rosenthal in view of Reimann, because Rosenthal in view of Reimann does not teach or suggest each and every feature of claim 38. For example, Rosenthal in view of Reimann does not teach or suggest "impacting the surface of the laminate by the conductive element, wherein said impacting forms a hole in the laminate".

The Examiner argues that in Rosenberg, the panel 20 is the laminate of claim 38, the sphere 22 is the conductive element of claim 38, and the hole 30 in FIG. 6 is the hole of claim 38

09/884,778

18

allegedly formed by the sphere 22 upon impacting the surface of the panel 20.

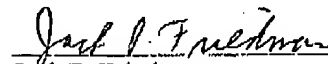
In response, Appellants respectfully contend that the hole 30 is preformed prior to insertion of the sphere 22 therein and is not formed by the sphere 22 upon impacting the surface of the panel 20. The hole 30 is just an embodiment of the hole 21 of FIG. 1 and the hole 21 of FIG. 1 is clearly a preformed hole. See Rosenthal, col. 2, lines 34-36 ("Referring to FIGURES 1, 2, and 5, a deformable panel 20 is formed with an aperture 21 for receiving a conductive sphere 22"). The remaining Figures, including FIG. 6, are variants of FIG. 1 in which conductors are disposed in the hole in different geometrical configurations. For FIG. 4, Rosenthal recites in col. 2, line 53: "When the sphere 22 is pushed into the aperture ...". For FIG. 6, Rosenthal recites in col. 2, lines: "The wires are first placed in the hole, then the sphere is pressed into the hole in the position shown". Appellants contend that it is clear from the language in Rosenthal that the hole is preformed in the panel 20 and is not formed by the sphere 22 upon impacting the surface of the panel 20 as alleged by the Examiner.

Based on the preceding arguments, Appellants respectfully maintain that claim 38 is not unpatentable over Rosenthal in view of Reimann, and that claim 38 is in condition for allowance. Since claim 39 depends from claim 38, Appellants contend that claim 39 is likewise in condition for allowance.

SUMMARY

In summary, Appellants respectfully request reversal of the October 6, 2004 office action rejection of claims 21, 22, 24, 27, 28, 31, and 36-39.

Respectfully submitted,



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Docket No.: END920000187US1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Hall et al.

Examiner: Dinh, T.

Serial No.: 09/884,778

Art Unit: 2841

Filing Date: 6/19/01

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**Title: METHOD AND APPARATUS TO ESTABLISH CIRCUIT LAYERS
INTERCONNECTIONS**Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450**APPENDIX A - CLAIMS ON APPEAL**

21. A method of forming a conductive path within a laminate, comprising:

- providing an opening in the laminate;
- pressing a conductive element into the opening such that a portion of at least one end of the conductive element extends beyond a surface of the laminate; and
- applying a compressive pressure to the portion of the at least one end of the conductive element, wherein the compressive pressure applied to the portion of the at least one end of the conductive element forms a contact pad extending beyond the surface of the laminate, and wherein the conductive element includes an inner element covered by an outer element.

22. The method of claim 21, wherein the opening is a hole.

24. The method of claim 21, wherein the conductive element is a cylinder.

09/884,778

21

27. A structure for interconnection between circuit layers, comprising:

a laminate having a conductive inner plane;

a conductive pad on a surface of the laminate, wherein a bottom surface of the conductive pad is in direct mechanical contact with the surface of the laminate;

a conductive element having a lower portion and an upper portion, wherein the lower portion of the conductive element is embedded into the laminate, wherein the upper portion of the conductive element extends above the surface of the laminate, wherein the conductive pad circumscribes the upper portion of the conductive element, wherein the conductive element electrically connects the conductive inner plane to the surface of the laminate, wherein the lower portion of the conductive element comprises a conductive material, and wherein the upper portion of the conductive element comprises the conductive material.

28. The structure of claim 27, further including an opening in the laminate that the conductive element is pressed into.

31. The structure of claim 27, wherein the conductive material is selected from the group consisting of: gold, copper, brass, and bronze.

36. A method of forming a conductive path within a laminate, comprising:

providing an opening in the laminate;

pressing a conductive element into the opening such that a portion of at least one end of the conductive element extends beyond a surface of the laminate; and

applying a compressive pressure to the portion of the at least one end of the conductive element, wherein the compressive pressure applied to the portion of the at least one end of the conductive element forms a contact pad extending beyond a surface of the laminate.

37. A structure for interconnection between circuit layers, comprising:

a first laminate having a first conductive element embedded into the first laminate wherein a portion of the first conductive element forms at least one contact pad extending beyond a surface of the first laminate;

a second laminate having a second conductive element embedded into the second laminate wherein a portion of the second conductive element forms at least one contact pad extending beyond a surface of the second laminate; and

a bonding layer between the first and second laminates such that the contact pads of the first and second conductive elements are electrically connected, wherein the bonding layer comprises conductive metal filled epoxy.

38. A method of forming a conductive path within a laminate, comprising the steps of:

providing a conductive element;

projecting the conductive element toward a surface of the laminate;

impacting the surface of the laminate by the conductive element, wherein said impacting forms a hole in the laminate such that the entire conductive element provided in the providing step becomes embedded within the hole.

39. The method of claim 38, wherein the conductive element is a sphere.

09/884,778

24

Docket No.: END920000187US1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Hall et al.

Examiner: Dinh, T.

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Filing Date: 6/19/01

Title: **METHOD AND APPARATUS TO ESTABLISH CIRCUIT LAYERS
INTERCONNECTIONS**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPENDIX B - EVIDENCE

There is no evidence entered by the Examiner and relied upon by Appellants in this appeal.

09/884,778

25

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APPENDIX C - RELATED PROCEEDINGS

There are no proceedings identified in the "Related Appeals and Interferences" section.

09/884,778

26